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WORD COUNT 1719
TIME SUBMITTED 30-JUL-2025 11:30AM
PAPER ID 117485105

AMALTEA MEDICAL PUBLISHING HOUSE
https://medscience.center/journals/

TYPE OF ARTICLE: Case Report

Cerebellopontine angle meningioma manifest as secondary trigeminal neuralgia: a case report

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ABSTRACT

Background. Trigeminal neuralgia (TN) is a type of neuropathic pain manifested in episodes of intense stabbing or electric shock-like pain that lasts from a few seconds to a few minutes. A wide variety of underlying etiologies can cause TN, including intracranial masses.

Case report. We report an unusual case of a left-sided TN that did not respond to conventional management. Brain MRI showed an extra-axial mass located at the left cerebellopontine angle (CPA) region that compresses the CN V, which was later confirmed as a CPA meningioma. After consulting with neurosurgery department, tumor resection surgery was performed. Histopathology study revealed WHO grade 1 meningioma.

Conclusions. After surgery, patient underwent routine visitations for three months and received additional medications. Patient reported significant pain reduction. Intracranial masses should be considered in TN cases, especially in cases that did not respond to conventional management.

Keywords: Trigeminal neuralgia, Cerebellopontine angle tumor, Meningioma

Abbreviations:
CN V – fifth cranial nerve
CPA – cerebellopontine angle
TN – trigeminal neuralgia

INTRODUCTION

Trigeminal neuralgia (TN) is a type of neuropathic pain affecting 1 in 15,000 - 20,000 people worldwide and is often misdiagnosed [1]. Vascular compression to the fifth cranial nerve (CN V) is the most common etiology, which also might involve nerve demyelination around the compression site. Additionally, around 6-16% of patients with TN had an underlying cause of intracranial tumors [2]. The most common tumor type to cause TN is vestibular schwannoma (acoustic neuroma), which can be presented with hearing loss, tinnitus, headaches, and vertigo [1-3].

The literature states that the pain characteristics of TN can be "severe abrupt unilateral facial pain, like an electric discharge, limited to one or more branches of the trigeminal nerve path" [1,2]. Sensorial stimuli in daily activities can trigger pain, such as washing the face, drinking water, speaking, and brushing their teeth. Pain duration may last for a few seconds. Diagnosis of TN is mainly according to anamnesis and physical examinations [3,4].

There are two main types of TN: classic and secondary. Classic TN includes vascular compression on CN V. Secondary TN is associated with other underlying diseases, such as multiple sclerosis or CN V compression by tumors [1,2]. This case report describes an uncommon cause of TN symptoms arising from cerebellopontine angle (CPA) meningioma compression on CN V.

CASE REPORT

A previously healthy 56-year-old female was referred to our department from the other district hospital with intractable left facial pain. She complained of severe left-sided facial pain with slight numbness, accompanied by tinnitus on the same side. She also explained that some daily activities, such as drinking water, washing the face, brushing teeth, and eating, can trigger facial pain. She has already visited the dental and otorhinolaryngology/ENT clinics with unremarkable findings. She had already visited a neurologist, who diagnosed her with trigeminal neuralgia (TN). The prior neurologist had prescribed her carbamazepine 200 mg twice daily. Initially, the patient had experienced improvement, but the symptoms worsened over the past 3 months, so she was referred to our department for further examination.

On her first visit to our clinic, the patient reported no complaints of hearing function. We increased the dose of carbamazepine to three times daily and added gabapentin. The patient reported mild symptoms of amelioration with this new regimen, but it was not for long. Past medical and family history were unremarkable. From neurology examinations, we found slight numbness on the left second and third branches of CN V, accompanied by a slight hearing reduction in the left ear. We

also found that the patient experienced mild tinnitus without facial nerve palsy or dizziness. There were no other significant abnormalities in other cranial nerves.

Because she did not respond very well to medications, we suspected a more serious pathology was present and referred the patient for an MRI workup. We decided to continue prescribing carbamazepine and gabapentin for the patient due to the persistent pain experienced by the patient and also because of the typical neuropathic components of the pain.

MRI results revealed a solid tumor with a diameter of 12 mm on the left CPA. (Figure 1) We also observed a slight enlargement of the left internal auditory canal. The aforementioned mass also compressed the left CN V. No contact of vascular components upon the CN V. We established a radiological diagnosis of meningioma, compressing the left CN V. We referred the patient to the neurosurgery department, which suggested that the patient required surgical treatment. Tumor removal surgery had alleviated the compression upon the left CN V. The patient experienced improved symptoms with no post-surgery complications, although still experiencing left-sided tinnitus. After 10 days of hospitalization, we discharged the patient. Histopathological study revealed WHO type 1 meningioma. The patient underwent three months of routine visitations at our clinic and reported significantly reduced pain symptoms, accompanied by carbamazepine 100 mg, one to two times daily.

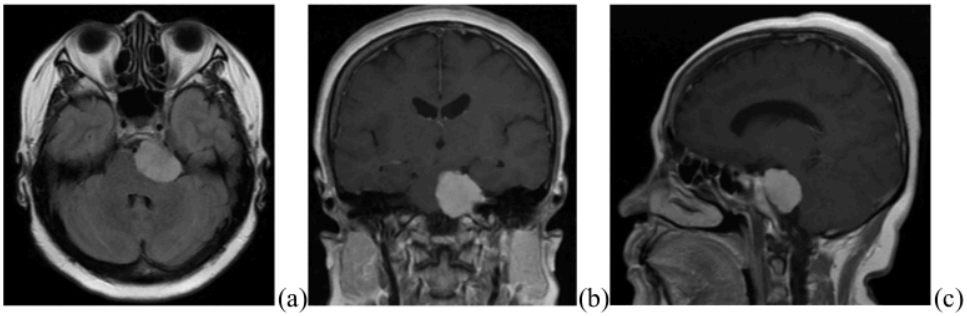
(a) (b) (c)

Figure 1. Left side CPA tumor compressing CN V in (a) transverse section, (b) coronal section, and (c) sagittal section

DISCUSSION

Our case presented a rare occurrence of secondary TN due to CPA meningioma. Very few reported cases of secondary TN are caused by intracranial tumors, let alone by CPA meningioma [4,6,7].

Facial pain is the most prevalent symptom of TN, which is characterized as unilateral pain that does not cross the midline [3]. TN-related pain is sudden and short, lasting from a few seconds to several minutes, accompanied by a refractory period in between episodes. A good response to

carbamazepine is a good indicator of TN diagnosis [3]. Vascular contact compression on the proximal parts of CN V is the most common cause of TN [2,3].

Around 15% of TN patients had an underlying intracranial pathology, which in our case is appropriate because the CPA anatomically corresponds to where CN V exited the brain, which brain MRI confirmed [3]. Prompt diagnosis and management of tumor-related secondary TN are crucial to avoid potential pitfalls [2,3]. Thorough and holistic examinations of CN V complemented with neuroimaging workups, such as brain MRI, are necessary for patients younger than 60 to identify potential structural lesions such as tumors or cerebral aneurysms [1-3].

We only found slight numbness, tinnitus, and painful TN in our case. Other possible compression-related symptoms of CN V should be explored. The impact of the compression on surrounding cranial nerves and blood vessels should also be considered, as it is often misdiagnosed [2-4]. Our patient complained of an electric shock-like pain (Numeric Pain Scale 7-9), which is exacerbated by sensory stimuli around the facial region while also experiencing left ear tinnitus.

Pharmacological management can be initiated with anticonvulsants [2,3]. Carbamazepine is the first-line drug of choice that can control 70-98% of TN-related pain cases, which can also benefit patients with intracranial tumor-related secondary TN [2-5]. Other anticonvulsants, such as gabapentin, can be considered alternatives for treating TN [3]. In our case, we implemented dual anticonvulsants of carbamazepine and gabapentin.

TN cases that manifest from CPA meningioma are still scarce [4-6]. Holistic diagnostic efforts, from anamnesis to neuroimaging workups, are essential in screening other differential diagnoses [5]. In the context of an underlying intracranial tumor, solitary orofacial pain is rare. Neurological deficits might be more prevalent in intracranial tumor pathology [4-6].

Our patient initially presented with symptoms of classical TN, but as the disease progressed, the intractable pain raised our concern to suspect other causes [4]. The patient also had limited benefits from pharmacological treatments. After being referred for an MRI workup, we can establish the diagnosis of secondary TN due to CPA meningioma.

Only 6% of patients with facial pain syndromes accounted for tumor-related secondary TN, with meningiomas and vestibular schwannomas being the most prevalent causes. Complete tumor resection is highly recommended, while emerging treatments are also already available, such as stereotactic radiosurgery/SRS [7,8]. Physicians should meticulously establish the clinical diagnosis based on the patient's clinical history and radiological workups while including CPA tumor as a possible underlying pathology of patients with TN.

CONCLUSION

We report a rare case of secondary TN due to CPA meningioma. Symptoms of TN were provoked by the direct compression of the tumor on the CN V. Complete tumor-removal brain surgery significantly improved the symptoms.

Patient consent:

The authors undersign and certify the written consent of the identified persons or their legal guardians for presenting the cases within this scientific paper.

Conflict of interest:

All of the authors confirmed that there are no financial or personal relationships that might bias the content of this work.

Authors' contributions:

Author RTP contributed to the conception and design of the study, data analysis, and interpretation. Authors AA and NAP contributed to the manuscript writing. All authors read and approved the final manuscript.

Financial support:

The authors self-funded this study.

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